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THE ZOOLOGIST:

A Monthly Journal

OF

NATURAL HISTORY,

FOR

RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES AND INSECTS.

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EDWARD NEWMAN.

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E. Newman, 9, Devonshire Street, Bishopsgate.

Letters on Variation in Lepidoptera. By EDWARD NEWMAN.

LETTER THE SECOND.—ALTERNATION OF GENERATIONS.

My dear Mr. Wollaston,

The theory of alternate generations or avism is exceedingly simple; it is that the child shall more closely resemble its grandmother than its mother: the male parent is not supposed to contravene this rule, but there is less certainty in investigating the phenomena: take an illustration of this, a female butterfly or moth is observed in the act of oviposition; we are liable to no mistake about the female parent, but are utterly ignorant of the male, the same with many of our domestic animals, as cats or house-dogs: now giving a designation, as B to the female moth, the female cat, or female dog, the theory would suppose the progeny of each (which may be designated as c), to resemble the grandparent (a) more than the parent (B), and therefore that a series of generations would exhibit certain characters alternately, thus:—a B c D e F g H i K l M n O: those generations designated by small letters possessing certain characters in common, and those designated by capitals possessing certain other characters in common.

It will at once be seen that this theory has a direct tendency to subvert the Lamarckian hypothesis of evolution, because the same series of generations can scarcely possess two opposite propensities, the propensity to change to something new, and the propensity to revert to something old; but this phase of the inquiry may be dismissed for the present, for it must be obvious to every one capable of reflection that so abstruse a question requires a more careful and critical examination than can be given it here. Be this as it may, a belief in the tendency to recede to a prior character is no hypothesis, since it is exhibited throughout the organized world, and is familiar to all breeders and to all naturalists. Professor Huxley, in his Lectures on the "Phenomena of Organic Nature," has entered fully into the subject, and has shown, beyond all possibility of dispute, that this tendency is universal, but that it is methodical also: it is called "atavism,"* and may be simply defined as a struggle to revert from recent change to the characters of a great-grandfather or great-grandmother, indeed to revert to some distant ancestral type. But the natural law, to which I now desire to invite especial attention, is not the reversion to a remote ancestral type so much as a particular and definite phase of the law, *a reversion to the distinguishing characters of the grandparent,* and this phase of a universal law I propose to call "avism."*

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* From *atavus*, a great grandfather or grandmother.

Beginning with man, we find the foot-prints of avism in mental and physical peculiarities, and descending even to malformation. Lunacy, phthisis, gout, are beyond all question hereditary, and beyond all question descend from grandparents, and so does abnormal formation. Professor Huxley cites a familiar instance. A Maltese family, Kelleia, had a tendency to produce offspring with six fingers to each hand, and six toes to each foot; Gratio Kelleia was the son of parents who had the ordinary number of fingers and toes; of his grandparents we know nothing; but Gratio had six fingers and six toes: at the age of twenty-two he married a lady with five fingers and five toes, and the result of the marriage was four children, one of whom, Salvator, had six fingers and six toes; the others, George, André and Marie, had the normal number of five: all of them married people having five fingers and five toes, but Marie's first boy was born with six fingers and six toes: these four generations may be designated thus:—

a. Name unrecorded, normal.
B. Gratio, monstrous.
c. Marie, normal.
D. Marie's boy, monstrous.

In this case whatever divergent facts may be adduced, and there are several, it still seems impossible to resist the conclusion that Marie's normal condition, and her son's abnormal condition, were equally derived from grandparents: c was similar to a, and D similar to B. There have been other instances of six-fingered gentry in the world, but I think none so carefully noted as this of the Kelleia's, which was first recorded by Réaumur. Peculiarities of all kinds, originating how they may, reappear in the same way: I have been particularly struck with the incurable habits of young people, and have found them hereditary; thus one persisted in biting his nails; a second in pressing the nail of her fifth finger into the palm of her hand; a third in holding the little finger erect when holding a cup of tea: all habits derived from their grandmothers, whom they had never seen.

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* From *avus*, a grandparent.

Again with horses, the methodical cropping out of hereditary peculiarities is a fact familiar to breeders; and even such natural peculiarities as the diverse colour of the two eyes are manifestly transmissible, and with almost absolute certainty, in alternate generations.*

It is, however, only by direct observation, and by the most careful breeding, that the phenomenon of avism can be clearly exemplified. The word "atavism," as rigidly applied, implies a reversion to the ancestral peculiarities or characters exhibited prior to grandparents; but avism as we shall find it in insects (which is really the point to be considered) goes back no farther than the penultimate generation: this is abundantly exemplified in horses, horned cattle, dogs, cats, rabbits, guinea-pigs, poultry and pigeons; and much as it may have been hidden from naturalists, it is perfectly familiar to breeders and dealers, who of course find their advantage in the knowledge. In guinea-pigs it is considered desirable to get them of two colours only, the ordinary colours being black, white and yellow; yellow is the colour least in favour, and of course breeders consider it desirable to exclude it altogether; but the sagacious breeder does not destroy the pigs adorned with this colour, unless the parents possessed the same ornamentation, for he knows that if a female possessing the desired character of colour produces tricoloured young, then the progeny of those young will assuredly revert to the desired colours of the grandmother. I have myself kept guinea-pigs, and have had excellent opportunities of observing this. Knowing the prevailing fashion, for I can call it nothing else, I once purchased a female guinea-pig with a perfectly white body and a perfectly black head: I kept her six years, during which period she of course produced "little pigs galore," but not one inherited the maternal perfections; yet among her grand-children the black heads were so abundant that I could afford to supply all my porcellus-fancying friends with these desirable cavies. In taking leave of these tailless pets, I may say that albinos are by no means so uncommon among them as Mr. Bell supposes.

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* An interesting note on this subject appears in the 'Zoologist' for June (S. S. 788), from the pen of Mr. Clark-Kennedy, concerning a dog which had eyes of different colours. "The man told me," he writes, "the dog was born with one eye blue and one dark brown. His mother was a greyhound and his father a mongrel, and their eyes were of the usual colour; but his grandfather was 'chany-eyed,' that is, had one eye blue and one brown. Might not this peculiarity have passed over one generation, in much the same way as lunacy or gout in families?" Certainly it had; and the comparison is not only to the point, but shows how well this natural law is known to observers.

Descending from sucklers, which are confessedly the most perfectly organized of animals, to the Salpæ, which are among the least perfectly organized, we find this avism an imperative and absolute law. Chamisso, in his treatise, 'De animalibus quibusdam e classe Vermium Linneanâ, Fasc. 1, de Salpa,' shows that this avism or alternation of generations is complete, and subject to no exception. The Salpæ are gelatinous, transparent marine animals, generally found in the form of a chain, but frequently also as detached individuals having considerable resemblance to a link of the chain. These two widely separated animal forms were formerly considered, as well they might be, distinct genera, and it was reserved for Chamisso to discover and divulge their true character. He found that the solitary Salpæ, when mature, always contained in the ovary a chain of associated Salpæ, all linked together exactly in the manner of the adult associated Salpæ. It appears to have occurred to him that there was some affinity between the solitary and the associated Salpæ, and that the solitary Salpæ might possibly be the detached links of the associated chain; but he was quite unprepared to consider the former as the *parents* of the latter. His astonishment was therefore great, when, in dissecting associated Salpæ, he found that these invariably contained solitary Salpæ; to use his own words, as translated by Professor Busk, he was forced to the conclusion "that *all* solitary Salpæ produced associated ones, and that *all* associated Salpæ were parents of solitary ones, and these again of the associated, and so on." Chamisso proceeds to amplify and elucidate this by adding, "so that a Salpæ mother is not like her daughter or her own mother, but resembles her sister, her granddaughter and her grandmother." Like every other discoverer, Chamisso had the full weight of scientific authority brought into antagonism with the conclusions at which he arrived; two points which may be very appropriately introduced here, were vehemently urged against him, *first*, the great difference between the associated and solitary Salpæ, and, *secondly*, that there was no similar instances of alternation throughout the animal kingdom. The scientific authorities of the day (1819), not content with simply pooh-poohing these discoveries, attempting by argument to refute them; *first*, by throwing a doubt over the accuracy of the observations; and, *secondly*, by giving them some other explanation. When I look back on the treatment of Chamisso, I cannot but feel comfort that the reception of Mr. J. V.

Thompson's researches into the metamorphosis of Crustacea, and my own theories on the true place of Stylops among insects, the composition of the thorax in Hymenoptera, and many other matters, have so grand a prototype as this persecution of poor Chamisso. Professors Meyen, Eschricht and Westwood have shown by irresistible arguments that such things cannot be, and their labours have received the endorse of the world of Science; nevertheless the onward progress of observation not only invalidates arguments, but corroborates and enforces facts; and the results may be safely entrusted to the inquiring spirit of the age in which we live.

In 1828 Sars made discoveries in the reproduction of Medusæ exactly parallel to those of Chamisso in that of Salpæ; and these were corroborated by Siebold in 1837; and in the same year Lovén published similar observations on Campanularia. The whole of these researches have since been reproduced and methodized by Steenstrup, and translated into our language by Professor Busk: so that we have the information at our very doors; and it results, in the words of Steenstrup, "in the remarkable and until now inexplicable natural phenomenon of an animal producing an offspring which at no time resembles its parent, but which, on the other hand, itself brings forth a progeny which returns in its form and nature to the parent animal, so that the mother does not find her resemblance in her own young, but in their descendants."

It remains to be stated that in endosteate animals, as the horse, cat, rabbit, pigeon, &c., these alternate generations are always regarded as mere abnormities, while in the lower groups they are received as genera: we have now to trace the same law in exosteates, and there we shall find them recognized as species.

It may safely be assumed that thousands of our book species of insects are neither more nor less than generations of species or moieties of species or fractional parts of species; but the subject is one which requires much closer investigation than it has hitherto received, and it is in vain for us to anticipate the day when these facts shall be made manifest by observations: the object of our collectors is to bring home the greatest possible number of individuals, or of so-called species, and when a collector ventures beyond this, and presumes to think and to observe, as well as collect, he seats himself complacently in the Darwinian groove, glides smoothly down into the unfathomable abyss of speculation, and endeavours to show that a butterfly with a spot more or less than usual on its wings, affords a proof that the individual, or race, or variety, forms one of a chain of generations which connects a monad with a man. What I desire is to see a naturalist thinking his own thoughts, making his own observations, and working out independent results. In England and Europe we have done this with many of our indigenous species, and great is the debt of gratitude we owe to those who have observed accurately, and reflected on their observations wisely: from such observations and reflections I select half a score examples:—

1. Leptoria diniensis of Boisduval is the autumnal brood of L. Sinapis of Linneus.
2. Pieris Chariclea of Stephens is the vernal brood of P. Brassicæ of Linneus.
3. Pieris Metra of Stephens is the vernal brood of P. Rapæ of Linneus.
4. Pieris Napeæ of Stephens is the autumnal brood of P. Napi of Linneus.
5. Vanessa Prorsa of Linneus is the vernal brood of V. Levana of Linneus.
6. Zygæna Ephialtes alternates with Z. Peucedani.
7. Selenia juliaria of Haworth is the summer brood of S. illunaria of Hübner.
8. Selenia delunaria of Hübner is the summer brood of S. lunaria of the Vienna Catalogue.
9. Selenia delunaria of Stephens is the summer brood of S. illustraria of Hübner.
10. Boarmia crepuscularia of Haworth is the vernal brood of B. biundularia of Esper.

It will be observed that these examples are selected from the Pieridæ, Vanessidæ, Zygænidæ, Ennomidæ and Boarmidæ, distinct and distant families, with a view of showing how extended are the effects of this law of avism.

I am sure that to your practical mind the mere enumeration of the names of these familiar insects will be sufficient, but in order to bring the matter more directly before some of those who may not have had your experience, it seems desirable to go a little more into detail, and to select an example for illustration, since the imperfectly informed entomologist might very excusably hesitate to receive my assertion that the two moieties of the species could be proved to have a common ancestry.

There are two Vanessæ on the Continent totally different in general colouring, superficial appearance and season of flight: they are described by Linneus, Fabricius and other authors of unquestioned authority, under the name of Levana and Prorsa; they are figured in Schäffer's 'Icones Insectorum circa Ratisbonam indigenorum;' Levana in pl. 217, figs. 3 and 4, Prorsa in pl. 132, figs. 1 and 2; and again in Hübner's 'Samlung Europaischer Schmetterlinge,' Levana, figs. 97 and 98; Prorsa, figs. 94, 95 and 96. These four great entomologists give the two insects as perfectly distinct, nor do they allude to any similarity between them. Levana appears on the wing in April, Prorsa in June and July. In 1843 Herrich-Schäffer's magnificent 'Schmetterlinge von Europa' appeared, and in this we find the intimation that Levana and Prorsa are the two moieties of one species; but notwithstanding this knowledge he gives both species, evidently considering the discovery too startling to be allowed to pass unchallenged. "That Prorsa and Levana really constitute but a single species," says Herrich-Schäffer, "is now perfectly established, but nevertheless I consider it best to allow both names to remain," as though he could not allow this astounding fact to appear all at once in its naked truth before the entomological world. It is now universally received by continental authors, and the only point proposed to be examined is whether the pupæ of Levana could by subjection to a low temperature be induced to remain in that state during the autumn and winter, and whether they would in the following April produce Levana or Prorsa. Again, whether *all* the alternating species complete two cycles or two generations in the course of every year, and whether *all* double-brooded insects are alternating, are questions which require the most careful investigation, but questions on which I will not presume to enter.

Another law, that of agamic reproduction, or agamogenesis, has been unfortunately so mixed up with this of atavism in the case of the Aphides or plant-lice, that it has become almost impossible to separate the two, and give to each its due importance; and here it may be observed that alternate generations are not unfrequently found to be agamic; but this would lead us into a field of inquiry too extensive for this essay. The winged Aphis, at the end of summer, leaves for ever the plant on which it has been nourished; it is borne on the wind without exhibiting any symptoms of volition; countless myriads perish, but some, a very small proportion, are driven against trees or shrubs, the sap of which will suit their descendants. The female when thus arrested in her compulsory course, deposits her eggs in little crevices of the bark, or, as some authors have said, in the axils of the leaves, and these eggs remain unhatched until the following spring or summer; they then produce a race entirely different from the parent, a race without wings, of different structure, different colour, eating a different food, and bearing a different name. Thus Aphis Humuli of the autumn may have wings, a well-developed mesothorax, a distinguishing colour, an oviparous mode of reproduction, and may feed exclusively on the juices of the hop; while its descendant, Aphis Pruni of the spring, will have no wings, no developed thorax, a different colour, a viviparous mode of reproduction, and will feed exclusively on the sloe. The account reads marvellously like a fable, but it is not so: Mr. Walker, who has thoroughly investigated the subject, knows that these things are so; and this not by chance or by accident, but by a fixed law from which there is no appeal.

I feel that the subject is rather indicated than exhausted in these cursory remarks, but I refrain from amplification: what I have adduced is incontrovertible, and must suffice; and I am sure you will see its important bearing on our systematized lists of species, which must be decimated when life-histories yet unknown are carefully worked out.

You will perhaps ask, are these laws of atavism and avism universal or exceptional? The query is germane to the matter under consideration, and must be met, but I will give a very modified and rather indefinite reply. May I illustrate my meaning by an example? I believe it a law that the four extremities of all endosteate animals shall terminate in five divisions, as in Man; but I know that in very many instances the exceptions are so numerous and so decided as to eclipse or conceal the rule; as, for instance, in our horses and cattle. So in atavism or avism I cannot doubt the universal prevalence of the law, although I am fully aware how generally it is obscured by exceptions which appear to be conflicting.

Believe me, dear Mr. Wollaston,
Most truly yours,
EDWARD NEWMAN.

PS. I have to acknowledge, with thanks, the receipt of a communication from Mr. Wallace, in reference to Letter I., but to say I must decline to publish any comments on this series of Letters until my readers are enabled to judge of them as a whole. I have also to apologize for a typographical error at p. 725; in the second and third lines the word "Euchelia" occurs: the first is correct, the second should be "Chelonia."—*E. N.*

Notes on the Genus Deinacrida in New Zealand.
By WALTER BULLER, Esq., F.L.S.

OF the curious genus Deinacrida two New Zealand species are already recorded, Deinacrida heteracantha and D. thoracica. The following notes respecting these species and another which has not hitherto been described may prove interesting to readers of the 'Zoologist.'

1. *Deinacrida heteracantha* ("Weta-punga" of the natives).—This fine species has a very limited geographical range. I have never heard of its occurrence south of the Waikato district in the North Island. Formerly it was abundant in the forests north of Auckland; of late years it has become extremely rare. The natives attribute its extermination to the introduced Norway rat, which now infests every part of the country, and devours almost anything. One of these insects, in the collection of the late Mr. Sinclair, measured, with its hind legs and antennæ stretched out, fourteen inches; its head and body, exclusive of appendages, being two inches and a half. A specimen which I obtained in a pine forest near the Kaipara River, more than ten years ago, and which is now deposited in the Auckland Museum, is even larger. The sexes differ considerably in size. The weta-punga appears to subsist chiefly on the green leaves of trees and shrubs: it climbs with agility, and is sometimes found on the topmost branches of the Kahikatea and other lofty trees. When disturbed it produces a clicking noise, accompanied by a slow movement of its hind legs. When taken it kicks or strikes backwards with its long hind legs, which are armed with double rows of sharp spurs; and unless dexterously seized will not fail to punish the offender's hand, the prick of its spurs causing an unpleasant stinging sensation. My friend Mr. William Mair, of Deveron, obtained some exceedingly fine examples of this insect in the Whangarei district. He found the killing of them, so as not to injure the specimens, a matter of some difficulty; and in one instance attempted to drown the insect in cold water, but found it, after four days' immersion, as lively and active as ever. In another case, a large weta-punga, which he had immersed in almost boiling water and laid aside in his insect-box as killed, revived in the course of a few hours, and appeared to be quite unharmed! A pair which I caught in a low belt of wood near the Wairoa, and secured in a pocket-handkerchief, ate their way out, and

escaped before my return to the spot where I had left them suspended.

2. *Deinacrida thoracica.*—This species is very common in the North Island. It infests decayed wood, and particularly the dead stems of the tutu (*Coriaria sarmentosa*), into which it bores. The male may be readily distinguished from the female by its large head and long powerful jaws. The ovipositor (in the female) is about half an inch long, and is slightly recurved. This insect is preyed on by the long-tailed cuckoo (*Eudynamis taïtensis*), the whistling parrot (*Nestor meridionalis*), and several other birds. In connection with this species of Deinacrida I have to record a remarkable circumstance which lately came under my own observation. Dr. Boor, of Wellington, who was collecting New Zealand insects, obtained several examples of the small weta, and dropped them alive into a bottle containing spirits of wine. One of them, after struggling for a few seconds, shot forth from the orifice of the alimentary canal two long processes, which came out from the body spirally and with a wonderfully rapid motion. The insect expired with these appendages disposed in coils. On examination I found that they measured, respectively, nine inches and eight inches and three-quarters, that they were of a rich brown colour, perfectly round, tapering to a point, elastic and resembling, in general appearance, a gutta-percha tube. This abnormal specimen is now in the Colonial Museum at Wellington.

3. *Deinacrida megacephala.*—I propose this name for a new species, of which I have received several examples (of both sexes) from the woods in the neighbourhood of Wellington. It is characterized by a head and mandibles so large as to appear out of all proportion to the size of the body. This exaggerated feature is wanting in the female, which, however, is distinguishable from Deinacrida thoracica by sufficiently obvious specific characters. The tibiæ are considerably thicker and more strongly armed with lateral spurs, although not longer, than in the other species; the thorax, which is ochreous-yellow, marked with black, in D. thoracica is of uniform dark umber, narrowly margined with brown; and the body of this species, instead of being pale brown, is deep reddish brown with transverse bands of black. The femora are marked on each side with three series of minute black spots, which are more conspicuous in the male. The following are measurements of the male:—Head and mandibles one inch; from anterior edge of thorax to the end of the abdomen one inch and three-sixteenths, the plate of the thorax measuring a quarter of an inch.

The antennæ are four inches long. Femur three-quarters of an inch; tibiæ one inch and three-sixteenths; tarsus and claws three-eighths of an inch. The vertex is much rounder or elevated and perfectly smooth.

WALTER BULLER.

Wanganui, New Zealand, May 2, 1867.

Extracts from a Journal of a Nesting Tour in Sutherland in 1867.

By JOHN A. HARVIE BROWN, Esq.

Wednesday, May 8.—Mr. Jesse and myself left Larbert for the North to-day, and arrived at Bonar at six o'clock in the evening. Long chat with our landlord there; he says he is certain that the jack snipe breeds in Sutherland, and he has himself seen the nest and eggs near the source of the Carron River, in Ross-shire. We offered a handsome reward to anyone who would bring or send a nest of eggs along with the old bird. Our landlord employed three different keepers, each of whom affirmed that he knew the bird to breed in his district. We afterwards received four common snipes' eggs and the old bird. Though we were thus disappointed, nevertheless I am still inclined to think that the bird *does* breed in the county, as I know several keepers there who know the bird as well as I do myself, and who would not confound it with either the dunlin or the common snipe. The late Mr. John Wolley's correspondent in Sutherland is among the number, and he knows all the birds of the county most perfectly ('Ootheca Wolleyana,' Part 1, page 39, and elsewhere, mentioned).

Thursday, May 9.—From Bonar to Altuacealgach Inn. Saw the following birds:—herring gull, lesser blackbacked gull (the commonest gull in the west of the county), great blackbacked gull, blackheaded gull, curlews, two magpies (the magpie is common about Rosehall and in the east of the county, but is almost unknown in the west), one hen harrier (male), one redstart, willow warblers, cuckoos, kestrels, chaffinches, wheatears, hooded crows (the common crow of the county), spotted flycatchers, robins, one raven, one missel thrush, one song thrush, rooks (do not in breeding season go further north than Cama Loch in the west). At Altuacealgach we received from our correspondent there five teal ducks' eggs and ten wild ducks' eggs, taken for us that day, also heron's eggs, &c.

Friday, May 10.—Visited a loch in the neighbourhood: saw graylag geese, redshanks, teal, wild duck, dunlins, sandpipers and one tern (?), but got no eggs, it being too early, and the winter and spring being severe.

Saturday, May 11.—Fished Cama Loch, where we took a few rooks' eggs (they have only come there during the last year or so), and saw common gulls and one dipper, which must have had young near, and one blackheaded bunting.

Monday, May 13.—Got curlew's nest with *four* eggs. I have found many curlews' nests in Stirlingshire, but never found more than three eggs in each nest before. We were informed, however, that four is the usual number in each nest here; and we afterwards found another nest also with four. Saw one whimbrel; they are scarce, but do breed in the county. Saw blackthroated divers on one loch, but no traces of the nest yet.

Wednesday, May 15.—Saw one buzzard, which flew over our heads when we were fishing Loch Bhallan (pronounced "Vallan"). A curlew chased it for a long distance and then returned to the neighbourhood of its nest. Took an egg or two from a grouse's nest, which was found by Mr. Jesse's retriever "Sailor."

Thursday, May 16.—After some trouble launched a raft, or double pontoon, and went out to an island on Loch —— to take blackthroated diver's eggs. After all our trouble found that it was too early, but we shall get the eggs in a few days. Both birds were swimming on the loch.

Friday, May 17.—Even the lower hills were covered with snow this morning, and rain fell in the lower ground. Started for Loch Ailsh, in our boat on springs, called "Camaloch;" launched her there, and paid a visit to the heronry on the island. The nests were placed in alder and birch-trees, often not six feet from the ground, and were composed of thick heather-roots and pieces of alder-wood outside, lined with heather-tops and moss, and in several I saw green blades of the wild leek (*Luzula* ?), which did not improve the effluvia from the nests. We took and blew several eggs, but most of them were far gone in incubation. We had had a good many eggs taken for us before by the keeper there and others. Also took kestrel's eggs from a low cliff on a burn near Loch Ailsh. Saw one blackthroated diver, some redbacked mergansers (not yet breeding), ring ouzels, &c.

Saturday, May 18.—Went to Loch Urigil. First shot a graylag goose from her nest, containing three eggs, which proved perfectly fresh; they lay from three to five eggs. Took also redshank's, dunlin's, sandpiper's and a lot of lesser blackbacked gull's eggs from the islands.

There is a considerable colony of the latter, which occupies the two largest islands. The dunlin's eggs were peculiar; they so closely resembled common sandpiper's eggs. I walked round the loch afterwards and saw a single greenshank; it did not seem to be nesting, but was only feeding on the side of the loch. To-day I found another curlew's nest containing four eggs.

Monday, May 20.—From Altuacealgach to Innisnadamph (ten miles). The keeper at the latter place had taken for us five hen harrier's eggs, shooting the female from the nest, but spoiling the latter for preserving. We blew all five successfully. Three of this nest were much spotted with minute red specks all over the shell. To-day, on the way to Innisnadamph, we looked for blackthroated diver's eggs on a loch near the road, and saw both birds, but got no eggs. We received eggs from our correspondent in Innisnadamph, amongst which were three of the graylag goose, hooded crows, &c. We learned of the peregrine's eyrie also, but were told that there were young. The four common snipe's eggs arrived to-day along with the bird. Expect to take blackheaded gulls from a loch near Canisbe (a mountain in the vicinity). The blackheaded gull is, however, by no means common in West Sutherland. We also heard of three different localities where the greenshank breeds, and intend to devote a day to the search for their eggs. Saw a sedge warbler on one of the lochs to-day. Shieldrakes breed on the east coast; widgeon on several lochs, but not in Assynt?

Wednesday, May 22.—Whilst fishing Loch Assynt we observed hedge sparrows and wrens on one of the islands. Took common gull's eggs.

Thursday, May 23.—I, along with a gillie and our landlord, took a ten-mile stretch over a shoulder of Ben More to look for ptarmigan's eggs (I had obtained full permission to shoot any birds I wanted for skinning from the Duke's factor at Scowrie). We were quite unsuccessful as regards ptarmigan, but I took a nest of four merlin's eggs. The nest was placed on a heathery ledge of a rock, and simply formed of heather-tops. We also visited a buzzard rock, but saw no traces of the nest, though I afterwards discovered it. Mr. Jesse took some more common gull's and hooded crow's eggs on the islands and shores of Loch Assynt.

Saturday, May 25.—Received from J. S. two blackthroated diver's eggs; one, as is often the case, was very long-shaped as compared with the other.

Monday, May 27.—The following is some information we received regarding the breeding of the buzzard:—If the old birds perceive anyone in the vicinity of their nest *before* the eggs are laid they will at once desert, but any keeper or shepherd, or other knowing the country, will easily find out their second choice. If *after* the eggs are laid the bird be disturbed she will destroy the eggs. J. S. has several times seen this take place. To-day had an unsuccessful stretch over the hills for ptarmigan's nest again, but the day was a bad one, there being thick mist on the ptarmigan-ground all day.

Wednesday, May 29.—Yesterday, along with our landlord at Innisnadamph, drove twenty miles to Scowrie. To-day engaged two cragsmen to go over the rocks on Handa, but few eggs were yet laid, owing to the backwardness of the season. Saw starlings, kittiwakes, guillemots, bridled guillemots, razorbills, cormorants, shags, puffins, herring gulls, great blackbacked gulls, rock pipits, black guillemots. Puffins are now much rarer on Handa, owing to rats having gained a footing on the island. Black guillemots are rare, although at one time plentiful. Cormorants were *introduced* to Handa, by Mr. MacIvor, the Duke's factor at Scowrie. Guillemots are the most plentiful species, and kittiwakes next. We received a Richardson's skua from Mr. MacIvor, shot a few days before on Handa. They are but rarely seen on the west coast, but are plentiful on the east coast. Its stomach contained a mass of zoophyte, a shrimp, and what we took for portions of beetles. It was a female, and the ovary contained about a dozen minute eggs. The bird was in very poor condition.

Thursday, May 30.—Visited the islands of Glen Coul, but only took oystercatchers and common gull's eggs, and received six redbreasted merganser's eggs taken that day.

Friday, May 31.—Received two more merlin's eggs. The merlin is a common hawk in Sutherland: I knew of three nesting-places within a very small area.

Saturday, June 1.—Devoted this day to searching for the greenshank's eggs at Loch ———, about five miles from Innisnadamph. Jesse and I beat every square foot of the ground, but could not find the nest. The birds were both there, dashing and crying round us all day, but only once coming within gun-shot of us. We searched for more than half a day amongst the long white grass which grows along the margins of the loch. The greenshank seldom or never lays amongst the heather. We finally offered a reward for the eggs, and one gillie worked very hard to get them, but nevertheless we had to leave Sutherland without them this season. The bird resembles the godwit, and is noticeable by the large patch of white above the tail. Some notes of its cry much resemble those of the redshank, but are louder and not so harsh. While one bird kept circling round us, the other, probably the male, was wilder: it sat on a boulder of stone on the hill-side, about two hundred yards off, uttering unceasingly a monotonous single note, and jerking up its head and neck. When alighting on the ground the wings are raised after the manner of the curlew, and the bird keeps calling quickly at the same time. They seemed to have particular spots along the loch-side which they constantly alighted upon. On our first approach to the loch the male bird rose from a mound of heather, and before we could run forward had succeeded in drawing the female from the nest. The best way, we were informed by the shepherds and gillies (who are mostly well acquainted with the bird), to obtain the eggs, is to stalk up to the loch and fire off a gun: the female will then spring straight from her nest. The nest is seldom placed far from water. There are generally two pairs breeding at this loch, but to-day we only saw one pair.

Monday, June 3.—To-day received two widgeon's eggs from a gentleman who had taken them on a loch near Lairg this season. They are generally quite an unmistakable egg, being creamy white, intermediate in size between a teal's egg and a wild duck's. After blowing, peculiar lines in the shell resembling cracks may often be observed.

Wednesday, June 5.—Here we are leaving the shepherd's house at Loch Skennaskink (properly in Cromarty), at five o'clock in the morning, to visit the islands. On the islands we take any quantity of lesser blackbacked gulls, sandpipers and a nest of eight widgeons, concerning which more anon. We arrived at the islands about half-past five. We had no oars for the boat, only two bits of birch wood to paddle us over. When on the third island the wind rose, and we were compelled to remain on it about four hours. It was on this island Mr. Jesse found the nest of widgeons (?). Whenever I saw them in the nest I unhesitatingly pronounced them to be widgeons' eggs. They were beautifully creamy, quite unlike any wild duck's eggs. The nest was almost circular, was placed in a bunch of heather, and was formed of wiry white grass, lined with down. The edge of the nest stood up perpendicularly from the basement to the height of about two inches. We left the eggs, and returned to the nest at intervals of from half an hour to an hour, but utterly failed to catch a glimpse of the bird. At last the wind fell, and we took the eight eggs, and made for the fourth island, which was only about one hundred yards distant. Here we took some more lesser blackbacked gull's eggs, a willow warbler's nest with six eggs (nest lined with gull's feathers), and shot a great blackbacked gull and secured the two young ones: this done we returned to the boat; but the wind had risen, and we could not get off. We had brought no provisions, no rugs, and only a little whisky, as we had expected to return to the shepherd's house in a couple of hours. The gale lasted for twenty-five hours,—*i. e.* from the time it first commenced,—and to add to our discomfort, at one o'clock P. M. it began to rain heavily also. We did not get back to the shepherds's house at Clash till six o'clock next morning, and to return to our headquarters we had some fourteen miles to walk and row after that. I may as well state here that the widgeon's eggs blew well, but some three days or so afterwards they lost the creamy tint almost entirely, though the *crack-like* lines became visible in some of them. Now, the two eggs I received on the 3rd of June have still retained the creamy tint to perfection. I cannot consider these eight eggs to be thoroughly identified, but at the same time I feel convinced that they are widgeon's eggs. The nest, when we found it, was quite *uncovered.* We had two gillies and our landlord with us on this excursion.

Thursday, June 6.—After breakfasting at Clash—the lone shepherd's cot—we started off over the hills towards Loch Maddie, *viâ* Loch Martle, trotted up Loch Maddie—in our boat which had been launched from the springs the day before yesterday—and arrived at Elphin: we received two buzzard's eggs from an assistant there; two merlin's and a redthroated diver's egg, along with a fine redthroated diver, a female. The buzzard's eggs were taken last year, and blown very well indeed with one hole by the person who gave us them; the others were taken a few days before, and were unblown. One of the merlin's is a most peculiar egg, being very dark sepia, almost approaching black: it is of the usual size, but contained no yelk. The redthroated diver's egg was pale green, with one or two large blotches of shaded reddish brown. Generally the redthroated diver's eggs are much darker than those of the blackthroated diver. The female bird was shot from the nest, which was placed close to the edge of a small peat-hole or pool of peat-water on the moor. To-day we also received another blackthroated diver's egg, which is a very long-shaped, light-coloured egg. This from the nest which we had formerly visited on the pontoon, May 16.

Friday, June 7.—Unsuccessful day after golden plover's nests. Received some kestrel's eggs.

Saturday, June 8.—Devoted this day to an attempt to obtain a blackthroated diver for stuffing. Went up to Altuacealgach by post-gig, where I received some duck's (*Anas boschas*) eggs, taken that day, —probably a second laying, as they proved quite fresh. Arriving at Loch Bhallan, along with a gillie and the keeper,—Mr. Jesse was fishing Loch Awe,—I lay down opposite the island while the keeper and gillie went round the opposite side of the loch. There was only one old bird, along with one young one, when we arrived, swimming on the loch; presently the other (probably the male) came flying round, and passed within long range of the keeper. "Bang" went that worthy's gun, and the bird dropped to the shot, and received the second shot on the water before he could dive; whether he really was winged or not we could not say, but he certainly was slow in diving: he now, after coming up, moved slowly across the loch towards my ambush, continually uttering a low guttural "gluck! gluck!" at regular intervals. I fired at about thirty yards distance, but he got under the surface before the shot reached him. We fired together some ten or fifteen shots afterwards, all to no purpose as regards the old birds, as they were now fully on the alert and dived instantaneously; the poor young one, however, got a stray shot in the neck, and we picked it up on the shore some little time afterwards: it lived with us till Monday morning, but died early on that day: we would have left it at the loch, knowing that the old birds would be much more wary after losing their young, only we were afraid that it would not survive the wound: we fed it moderately on pieces of fish, and it had a tub to swim about in; it was amusing to see it peck at anyone who put his or her fingers near it. I have since had it stuffed. We are told that though the female blackthroated diver lays two eggs, more than one young one is seldom seen in company with the old birds, and this instance is certainly in favour of this supposed rule. It was Mr. Wolley's correspondent who told us of this: he has in his time taken scores of their eggs and seen plenty of the young birds. He also told us the following regarding them: if the first laying of eggs be taken, a second couple of eggs may often be laid by the same bird in a week afterwards. The blackthroated diver is more plentiful in Assynt than the redthroated diver, but the latter is more plentiful in

Tongue—further north than the former. The blackthroated divers do not often cry except when they lose their young, but the redthroated diver may often be heard calling, with its wild almost unearthly shriek between the "miawling" of a cat and the cry of a child in pain. Both species call more in the evening or night time than through the day. The blackthroated diver almost invariably chooses to place its nest on an island, though there are instances of its laying on the margin of a loch. The redthroated diver lays its eggs as often on the shore as on the islands. The blackthroated diver makes scarcely any nest, but deposits its two eggs—one of which is invariably lighter-coloured and longer-shaped than the other—within a foot or two of the water, and the redthroated diver is generally considered to lay them much nearer the edge, and always above deep water. The same informant tells me the following: a groove in the channel is, where such channel is present, always to be seen between the nest of the blackthroated diver and the water. Once my informant set a trap in this pathway with a view to capture one of the old birds: when he revisited the trap he found only some of the breast-feathers, and the trap sprung. The young bird, which we had, when placed on a table or other level surface, threw the legs far back and seemed to push itself forward, without any aid from them whatever.

Monday, June 10.—Tried again to procure the blackthroated diver, and saw distinctly that it was wounded, but could not get any reasonable shots at it. Knocked some feathers out of a greenshank and picked up two legs of a young one, which had probably been killed by some bird or other animal of prey. A peregrine's eyrie is not far distant from the loch which the greenshanks frequent. At the abovementioned eyrie I found the legs of a young curlew one day before. It is generally supposed that the peregrine always takes its prey on the wing, but this looks as if such was not always the case. Heard of another redthroated diver's egg being taken on another loch, but we did not succeed in obtaining it. Obtained five ptarmigan's eggs; they are lighter in the ground colour than grouse's eggs, and shorter or rounder in shape. We are assured that it is seldom that ptarmigan lay eggs as dark coloured as a *type* grouse's eggs, but that grouse not unfrequently lay eggs as light-coloured as the *type* ptarmigan's eggs.

Tuesday, June 11.—To-day Mr. Jesse and I obtained permission from Mr. MacIvor to fish the River Inver. I succeeded in getting one fish weighing eleven pounds and a half, clean run, and Mr. Jesse got some twenty trout, which weighed ten pounds, with two or three at one pound.

Friday, June 14.—Having driven over to Scowrie, and made arrangements with our two cragsmen last night, we set off to Handa this morning, and were more successful in our visit this time, obtaining a fine series of guillemot's and kittiwake's eggs as well as razorbill's and puffin's. At one time Peter must have brought up some sixty pounds weight of eggs in the pockets of Mr. Jesse's shooting coat. We shot some specimens of the rock birds for skins, and sat up till one o'clock in the morning, washing, blowing and marking eggs. The breeding-place of the great blackbacked gulls is perfectly inaccessible to man; at least up to this present date no man has ever stood on the top of "The Stack." This stack is an isolated pillar of rock on the northern portion of the island, fully as high as the main island: in it there are still a considerable number of puffins, the rats not having been in this case any more active than the nobler animal. There is a small colony of great blackbacked gulls and legions of guillemots, kittiwakes, razorbills, &c., breeding on it. I consider that there are far more birds on the island of Handa than at Hoy Head in Orkney, the Bass Rock in the Firth of Forth, and Ailsa Craig in the Firth of Clyde put together, and I have seen them all at close quarters except the last, which I only viewed at about a quarter of a mile distance. To-day we were not able to go round Handa in a boat, owing to the sea which was running, but any birds we wanted we either noosed on the ledges with a fishing-rod and hair-noose, or shot them so as to make them drop on the land (which last is very good practice).

Saturday, June 15.—To-day we visited the Badcall Islands, and helped ourselves very liberally to cormorant's eggs, which we found (even at this late date) on a rock where any child might have lifted them without danger or fear of danger. We failed in getting black guillemot's, which are now becoming rare on Handa and the Badcall Islands, perhaps owing to the rats, but more likely to the introduction of sheep to both places. We also took a few herring gull's eggs, which bird seems to be far from common on the west coast. Saw immense numbers of oystercatchers, but were too late for their eggs. Those eggs of the oystercatcher which we took in Glen Coul were much smaller than any I ever saw or took before, but the fisherman who piloted us said that he never saw them there any larger: they are sometimes called "ministers" by the fishermen, and are believed to forewarn the latter of stormy weather. The refuse of crabs and limpets and other shell-fish were strewed all over the islands of Badcall Bay, being the "twelve basketsful" left over from many an oystercatcher's feast.

Tuesday, June 18.—Left Innisnadamph and slept at Bonar Bridge (thirty-eight miles). Mr. Jesse remained behind me at the former place to have some fishing. I visited, about ten o'clock at night, Loch Migdale, and took a score or so of blackheaded gull's eggs and a dozen tern's (arctic or common? I had no gun to shoot a specimen with). One of the gull's eggs was pale blue without marks.

Wednesday, June 18.—Left Bonar Bridge at 6.15 A.M. by train and arrived at home about 9 o'clock P.M.

I will now give a list of the species of birds which we noticed in May and June in West Sutherland, and also will include in that list any others that we had reliable authority for, as breeding or visiting the county.

Golden Eagle.—Still breeds in different localities, but none seen by us.

Sea Eagle.—Still not uncommon; saw one in Glen Coul in August, 1866; heard of more than one eyrie.

(*Osprey.*—Is now, I believe, extinct in the county.)

Peregrine.—Common.

Merlin.—Next to the kestrel, the commonest hawk in West Sutherland.

Kestrel.—Very abundant.

Sparrowhawk.—Not known in the west, but common around Rosehall and in the east.

Buzzard.—Still plentiful; we saw several pairs of birds this season, and knew of some four or five breeding-places.

Hen Harrier.—Common; are always to be found about the same hill-side every season.

(*Longeared Owl.*—Is found, I believe, not uncommonly about the shores of Loch Migdale in the east, but is unknown in the west. None observed by us, in either west or east.)

Barn Owl.—I have seen more than one on the shores of the Assynt Lochs, where they select an old hooded crow's nest to deposit their eggs in. They are not, however, by any means plentiful.

Shorteared Owl.—Is occasionally shot in autumn and winter. I cannot hear of its breeding in Sutherland.

Spotted Flycatcher.—Two or three seen at Rosehall.

Dipper.—A pair on every stream. Sixpence per head is still given to the keepers for such as they destroy. Called here the "kingfisher."

Missel Thrush.—Rosehall; not common.

Song Thrush.—Common at Loch Inver, Scowrie, &c.

Blackbird.—Rare in breeding-season.

Ring Ouzel.—Abundant, but seldom more than one pair or at most two pairs in the same locality; called here the "blackbird."

Hedge Sparrow.—Seen at several places, and once at a great elevation. Selby noticed the same in 1834.

Redbreast.—Rosehall and in Assynt; generally distributed, but not plentiful in the west.

Redstart.—Rosehall, and one seen on Loch Awe.

Stonechat and Whinchat.—Plentiful in some localities and scarce in others. Observed principally at Unapool Ferry.

Wheatear.—Very abundant, but never going far up the hills.

Sedge Warbler.—We did not observe many, but I believe that the cold east winds and bad weather did much towards keeping back many of the migratory species. Corn crakes were this year scarce, and we only saw two or three swallows the whole time we were in West Sutherland.

Whitethroat.—Observed by Mr. Selby in 1834, but none came under our observation. It is, I believe, scarce so far north.

Wood Warbler.—Very abundant: wherever a solitary birch-bush is, there one is certain to find the wood warbler, and they are quite numerous on the birch-covered shores of Loch Assynt and other lochs.

Blue Tit and Cole Tit.—Observed at Rosehall by Mr. Selby.

Pied and Gray Wagtail.—Plentiful.

Meadow Pipit.—Plentiful; never ascends, as far as I could see, above the heather.

Rock Pipit.—Plentiful on Handa and all along the coast.

Skylark.—Plentiful, especially at Scowrie.

Bunting.—Observed, by Mr. Selby, near Rosehall, where he says it is plentiful.

Blackheaded Bunting, Yellow Bunting and Chaffinch.—Common.

House Sparrow.—Scarcely ever seen in the west of the county, but plentiful elsewhere.

Goldfinch and Siskin.—Breed at Dunrobin, east.

(*Linnet.*—I believe plentiful, though we observed none.)

Twite.—Numerous, especially about Unapool.

Starling.—At Scowrie, Badcall, and at Smoo Cave, in Tongue (*Selby*).

Raven.—Plentiful still.

(*Hooded Crow.*—There are no carrion crows in Sutherland. Out of several hundreds killed in 1834 and two years previously (*Selby*), not one was a carrion crow.)

Rook.—At Rosehall. Furthest north in the west at Cama Loch.

Magpie.—Two seen at Rosehall; none in the west.

Wren.—Seen several times.

Cuckoo.—Very abundant.

Swallow.—Only two seen at Scowrie; seen at Bonar. Late this season in arriving.

Martin.—A colony on the limestone-cliffs behind Innisnadamph, but we only saw some two or three birds altogether this season.

Swift.—Smoo Cave, Tongue (*Selby*).

Goatsucker.—Rosehall. Breeds there, but we observed none.

Ring Dove.—Rosehall. Only two seen in the west.

Rock Dove.—Plentiful; never breeding in the caves of the islands, but always in those of the mainland.

Pheasant.—Rosehall and other preserves.

Black and Red Grouse.—Not plentiful as compared with other counties.

Ptarmigan.—Very plentiful on Ben More, Assynt, Braeback, Quinaig and others of the hills.

Partridge.—Not common in the west, but at Rosehall, &c.

Golden Plover.—Exceedingly abundant.

Ringed Plover.—Only observed one pair in the west; plentiful on east coast.

Peewit.—Plentiful in some localities.

Oystercatcher.—Abundant, but seldom coming inland to breed, as they do on the Tummel, Tay, Spey, Dee and others of the larger rivers. They do breed inland on Loch Shin.

Heron.—Several heronries in Assynt; the largest at Loch Ailsh (properly in Ross-shire).

Curlew.—Abundant.

Whimbrel.—Only saw one; do not seem plentiful, though they are known to the shepherds and gillies.

Redshank.—Did not appear to be so plentiful as one would be led to expect from the nature of the country. There are, I believe, upwards of three hundred lochs in Assynt alone.

Common Sandpiper.—Very common.

Greenshank.—By no means a rare bird—*i. e.* there may be some half-dozen breeding-places in Assynt alone.

Woodcock.—I saw none in spring, but have shot them in Assynt in August.

Snipe.—Common.

Jack Snipe.—See above, p. 851.

Dunlin.—Common.

Landrail.—Common most seasons, but this season we observed or heard very few.

Moorhen.—Does occur, but rarely.

Coot.—Rare; did not observe any.

Graylag Goose.—Breeds on many of the lochs of Assynt, as on Loch Urigil, Gorm and others.

Bean Goose.—This I insert as breeding on Loch Laoghal, on the authority of Mr. MacLeay, naturalist, Inverness.

Wild Duck.—Common.

Teal.—Common also, but frequenting certain spots every season.

Widgeon.—Scattered sparingly over the county; one pair or so on a loch, not more.

Scaup.—One female shot by Sir W. Jardine, in 1834; was accompanied by a young one (See Selby's "Birds and Quadrupeds of Sutherland," in the 'Philosophical Journal' for April, 1836.

Redbreasted Merganser.—Common; we obtained eggs at Kylesker. One or two pair on most of the lochs.

Little Grebe.—Rare (*Selby*). We saw none.

Great Northern Diver.—Mr. Selby observed one pair in Balnakiel Bay, in the north of the county, but did not find them breeding.

Blackthroated Diver.—Plentiful in Assynt, but scarce further north on the west, though found further north more inland.

Redthroated Diver.—Not so plentiful in Assynt as further north, where it replaces the last species.

Guillemot.—Abundant on Handa.

Ringed Guillemot.—More plentiful, I think, at Handa than at Hoy Head, in Orkney.

Black Guillemot.—Not now so plentiful as formerly.

Puffin.—Also decreasing in numbers.

Razorbill.—Plentiful.

Cormorant.—Abundant on Badcall Islands, and increasing in numbers on Handa, where they were introduced by Mr. MacIvor, the Duke's factor at Scowrie.

Shag.—Abundant.

Gannet.—Generally seen on the north coast, but comes much further south sometimes after herrings, &c.

Common (and Arctic?) Tern.—Common on the east, but rare on the west coast. We only saw one pair in Assynt.

Blackheaded Gull.—Plentiful on the east coast, as at Loch Migdale, but scarce on west. Used to breed at a small loch at base of Canisb Mountain, but were not present there this season.

Kittiwake.—Abundant on Handa.

Common Gull.—Abundant.

Lesser Blackbacked Gull.—The most numerous species in West Sutherland; large colonies on Lochs Urigil and Skennaskink (Cromarty) and on the Badcall Islands.

Herring Gull.—By no means an abundant species; we only took two nests on the Badcall Islands.

Great Blackbacked Gull.—A colony on Handa, and a pair or two found breeding on many of the lochs.

Richardson's Skua.—One shot at Handa; rare on west coast, common on east.

To the above list of course many species might be added, including winter migrants, but it is better to avoid entering them in it at all. There must also, I think, be other birds found breeding amongst the three hundred lochs of Assynt and the two hundred and fifty of Edderachyllis, if they were thoroughly explored. The scaup, for instance, has only once been discovered breeding, and such a bird as the pintail duck might breed just as readily. There are many lochs which have never had the angler's fly cast over them, and which have never been explored by any ornithologist, and it was only in 1834 that such birds as the blackthroated diver, widgeon, wild goose, &c., were known to breed in the wilds of Sutherland. I can only offer the above imperfect list as it is, hoping that some other will extend it to its rightful length, and that it may prove to have some interest for some of the readers of the 'Zoologist.' I have been much indebted to Mr.

MacIvor, the Duke's factor for the Assynt and Edderachyllis districts, for the kind permission he gave to use a gun for collecting purposes, as also for the permission he gave to fish the River Inver, and I cannot forget to thank most cordially all those who assisted us in collecting, and without whose aid we would have done but little. The cheerful willing way in which all our gillies and assistants helped us is very different, in my opinion, from what may too often be met with in more southern counties for a greater price. The inhabitants seem to have generally a good idea of the natural productions of their native hills, much more so than is found further south, where money absorbs the whole thoughts and employs the whole time of common labourer and master alike. But as this is scarcely "ornithological," I will now bring these extracts to a close.

JOHN A. HARVIE BROWN.

Dunipace House, Falkirk,
July, 1867.

Notes on the Ornithology of the English Lakes.

By JOHN CORDEAUX, Esq.

JUNE, 1867.

On looking through my note-book I feel somewhat disappointed at the result of three weeks' work, and the little information gathered connected with the Ornithology of this district. In a botanical point of view, however, my visit has been a great success, finding many plants I scarcely hoped to have seen. Often in my wanderings over these wild fells have I regretted my ignorance of Entomology; for indeed this Lake district seems to be a perfect paradise for an entomologist—every part, from the sedge-margined lakes to the crests of the great hills overshadowing them, teeming with insect life. Nor is it less interesting to the geologist, for here he will find himself surrounded by some of the oldest of the stratified rocks. On the summits of many of these great fells, nearly every stone we pick up has its own distinctive features, and, to those who can rightly read it, its own record of the ancient world.

I have extracted the following remarks on the birds of this district from my note-book: they have been taken from day to day, during a short residence at Grasmere, and I now give them, trusting they will not be found altogether devoid of interest to the readers of the 'Zoologist.'

Peregrine Falcon.—A pair of peregrines have now for three years had their eyrie in an almost inaccessible precipice, flanking Helvellyn, and for two years brought off their young unmolested. This summer the eyrie was reached from above, by a Grasmere stone-mason, and the two young falcons taken. The mother, strongly protesting against the abduction of her young ones, was cruelly shot by this same fellow; but he did not get his victim, as she fell, lodging on the face of some inaccessible rocks: one of these young falcons died a few days after its capture; the other I saw in the possession of this man, and intended purchasing it before leaving the district; unfortunately, however, it also followed in the steps of its comrade—drooped and died. Thus, in little more than a week, three out of four of probably the only peregrines in the Lake district have uselessly perished. In these days any notice of our noblest and rarest birds of prey is little more than a record of their destruction.

Common Buzzard.—Buzzards are, I am very glad to say, as yet far from uncommon: I found two pairs, and heard of another pair, in the neighbourhood of Grasmere, first seeing them near the rocks above Grisdale Pass, near Grisdale tarn. I was resting on the short turf near the Patterdale end of the tarn, and (for it was intensely hot and close) under the shadow of a great rock—a huge boulder—all spotted with yellow and gray lichens, and a great pink boss of that lovely arctic plant Silene acaulis; many a mountain ramble in bygone years did that bonny little plant bring to my recollection: not a ripple crossed the surface of the tarn—itself a mirror, reflecting the green hill-sides, the glorious blue sky, and those light cirrus clouds, now resting almost motionless, far above the stony crest of Fairfield: for a time the only sound was the monotonous chirp of the little brown pipit; then from the higher crags came the harsh croak of a raven, and a pair of these birds dashed downwards across the tarn, closely pursued—yes, *closely* pursued—by two buzzards. We are told the buzzard is a cowardly fellow; he will fly before the magpie and jackdaw: there was certainly an exception in this case, for the ravens had unmistakably the worst of the encounter, nor did the buzzards desist from the pursuit of the vanquished, till they had fairly driven them across the crest of Seat Sandal. Perhaps Corvus corax had been prying too closely into the domestic arrangements of the buzzards, and hence this display of wrath: and now began a magnificent spectacle; the two hawks, satisfied with their victory, began wheeling in wide circles above the little lake, the one bird keeping somewhat higher than the other, and at an opposite point of the circle, and thus they rose in this wonderful spiral flight, circle above circle, to an immense height, their broad and rounded and somewhat ragged wings perfectly motionless, the primary quills somewhat curved upwards, and thus, circle above circle, now mere larks in size, but still circling, till the wearied eye failed to follow them as they vanished against the intense blue of heaven. To my fancy this ignoble buzzard is one of our noblest birds of prey: when seen amidst wild scenery, they always harmonize with surrounding objects, and I know no bird which excels them in stateliness and magnificence of flight—no, not even the royal eagle himself.

July 1st. To-day, when descending the rocks between Easdale and Codale tarns, disturbed a pair of buzzards, and think they had a nest not far off, as the hawks were greatly disgusted, flying backwards and forwards over my head, constantly uttering their wild and melancholy cry of "Kei-er, kei-er." In the evening went to look at a young buzzard at the house of a labourer at Grasmere. A very fine healthy looking bird; the man said he had taken it from the nest on the rocks, a few days since, somewhere between Steel Fell and High Raise, and that it was the only one in the nest.

Raven.—Common on the higher fells, and generally nesting on the most inaccessible precipices.

Spotted Flycatcher.—Very common in all the well-wooded and cultivated portion of this district, particularly in the woods and gardens bordering the great lakes.

Pied Flycatcher.—Not uncommon in the neighbourhood of Grasmere; more generally found about the skirts of the woods and plantations on the fell-sides and bordering the lakes than in the gardens and pleasure-grounds, *par excellence*, the haunts of its spotted cousin. First met with this little bird on the outskirts of Grasmere village, near the Red-bank road; was attracted to the spot by its song, a most pleasing little song, and one then quite new to me: the little warbler was sitting on the bough of a pollard-ash; it was by no means shy, permitting a close approach. It is not easy to represent the notes of a small bird on paper; I put them down in my note-book at the time as resembling the words "Twe-tweetle, tweetle, tweetle, twote." It is a merry rattling little song: twice the little fellow paused, dashing out to capture a passing fly. After this had not an opportunity of prosecuting the search after the pied flycatcher for some days. On the 2nd of July gave up an afternoon for that purpose. Was informed I should probably find them in the plantations skirting the foot of Silver-how; and was not disappointed, first finding a beautiful male, hawking for flies from a rail-top: his manner of capturing them was peculiar, sometimes taking one on the wing, but generally flying down amongst the long grass, clinging for an instant to some bent, or flower-stalk, and *picking off* an insect, between each capture returning to the rail-top. The colours of the bird are so clearly marked, and show so strong a contrast, as to lead to its instant recognition, even at a considerable distance. A little higher up on this fell-side found a male and female with four young ones: the parent birds were hard at work catching insects for their family, perched on the adjoining bushes: one little fellow was bathing himself in a pool of water below the tall fern-fronds, seemingly deriving intense pleasure from the operation; another was foraging on his own account, sitting in the midst of an hazel, and picking the small flies from off the bright green leaves. The old birds seldom took a fly on the wing, either alighting for that purpose for an instant on the ferns and grasses, or, clinging to the bole of some tree, would pick out the insects from the interstices of the bark: observed them do this repeatedly, both from the oak and the smoother bark of the birch. All this passed within a few yards, as I lounged against the railings; I might indeed have been part of the fence, so little did they heed my presence, often alighting within a dozen feet. They are a smaller bird than the spotted flycatcher. In the female the colours are not as distinctly marked as in the male: the young birds might easily be mistaken for those of the spotted flycatcher: the quills and tail are dark or black-brown; a portion of the outer tail-feathers white; centre of wings dull gray, showing, when the wings are closed, a broad indistinct gray streak, in the place of the pure white of the adult; upper parts brown; under parts dull gray, on the neck and breast streaked with wood-brown. In the adult the pure white on the secondaries and primaries, when the wings are closed, contrasting with the black back, gives the bird the appearance of wearing a black mantle with a broad white border.

Ring Ouzel.—Common on the higher fells; observed several young birds during the last week in June.

Redstart.—Next to the spotted flycatcher the most frequently met with of any of our summer visitors, and may be seen as far up on the fells as any trees or brushwood are found.

Stonechat.—Not nearly so common as the redstart, yet generally distributed through the district. Never saw this bird on the top of the higher fells, invariably finding it from the base to rather more than half-way up to the summit. Did not observe the whinchat in the neighbourhood.

Wheatear.—Common, more particularly in the elevated fell district; seen on the summit of all the highest hills. One day saw a male of this species, with a fly in his mouth, alight on the branch of a spruce-fir.

Pied and Gray Wagtails.—Common, and equally distributed. I did not see one common yellow wagtail (*Motacilla Rayi*) anywhere in the neighbourhood of Grasmere.

Tree and Meadow Pipits.—The tree pipit, I fancy, is a scarce bird in this district; have only once heard it. The meadow pipit is everywhere common, from the cultivated valley to the tops of the highest and bleakest fells, where, often for miles together, its simple little song is the only indication of bird-life.

Mountain Linnet.—Not uncommon; observed several in the vicinity of Fairfield and the Grisdale Pass.

Swift.—Only once seen; I was then on the highest point of the Borrowdale Fells, the wind north, and, in that elevated region, bitterly cold, and I was only too glad to get under shelter of the nearest rock: on looking upwards from this point could just discern a party of swifts hawking; they were scarcely distinguishable, although the air was remarkably clear: I judged them not much less than three thousand feet above the summit of the fell, itself nearly three thousand feet above the sea-level. To what an immense height had these swifts ascended, and what insects would they find in that "cold thin atmosphere?" Probably, however, in those higher regions, a warmer current of air was blowing from the west or south.

Fern Owl.—Not seen, but, in the pleasant summer nights, frequently heard; evidently are no strangers in the woods which girdle Grasmere Lake. Often late in the evening, when all was still, have I paused in rowing over the lake, to listen to the strange notes of the night birds. A concert not equal to that wonderful burst of melody we may sometimes hear in early morning, when blackbird and thrush, and all the rest of our little early-rising warblers are pouring forth their morning hymn of praise, and greeting the rising sun with such a burst of melody as no combination of human voice and instruments can rival, or even distantly approach unto; yet it was a concert worth listening to, and although the notes were not so musical as those of the day warblers, yet they seemed well suited to the time and scene; for all the owls on Redbank were hooting, and an answering challenge, softened by distance, was returned from their brethren on Fairfield; and between the shoutings of these noisy owls, came another sound, less distinctly heard, but more prolonged, that seemed to run all up and down along the dark wood-side,—once heard not to be forgotten, —the jarring note of the night-hawk, that peculiar burring, long-drawn note, a sound which is so totally unlike that made by any other bird, and the locality of which it is so difficult to fix; and, nearer still, from amongst the reeds and water-lillies, and along the margin of the placid mere, coots were clanking, the restless sandpipers whistling; and, not to be put down by any of them, the little reed wren rattling away at its own wild song, and, not content with that, appropriating the notes of many another bird then quietly at rest in the woods of Silverhow.

Dotterel.—All endeavours to find these birds have been unavailing: I have walked upwards of one hundred miles over these hills, the greater portion of this distance over very likely dotterel-ground, without either seeing or hearing any; and yet almost everyone spoken to on the subject,—guides, shepherds, &c.,—tells me that they may still be found in the district, some years indeed in considerable numbers. All agree that this year they are few and far between; and I believe this is the case, as I certainly must have either seen or heard some in the ground walked over. They arrive in this district about the last week in May, and are then much sought after by local fly-fishers for the sake of their feathers. A gentleman at Grasmere told me that he had this season given half-a-crown for one; and another person informed me he had been out frequently on the fells with his gun, but had not yet met with any. A shepherd had seen them lately on Helvellyn; and a car-driver at Keswick told me that a few weeks since he took a nest, containing two eggs, on one of the neighbouring fells. Have frequently been told I should certainly find them on such a hill, or range of hills; every attempt, however, and I gave up a large portion of my time for this purpose, ended in disappointment.

Golden Plover.—Not uncommon on the higher fells, where they breed. Saw several pairs of golden plover on the Borrowdale Fells, a situation well adapted for their summer residence. These fells comprise Bleaberry Fell, High-seat and High Raise—a great wild moorland, miles in extent, seldom visited except by the hill shepherds: it contains extensive bogs,—now white with cotton-grass,—some miles of heather and rein-deer moss, and a considerable extent of hill-pasturage, sedges and the great hair-moss. I saw no young plovers; the old birds were generally in pairs, and I remarked they were much tamer and less suspicious than when last I had the pleasure of seeing them in the North Lincolnshire marches.

Sandpiper.—Common on the shores of all the lakes and tarns in this district. I saw a sandpiper fly up from the side of the lake and perch on the slender bough of an alder-tree, where it remained for some time.

JOHN CORDEAUX.

Grasmere, July 3, 1867.

Ornithological Notes from Norfolk, for March, April, May and June, 1867. By HENRY STEVENSON, Esq.

(Continued from Zool. S. S. 730.)

Brambling.—These birds were still with us, in some numbers, up to the 26th of March, on which date I was shown some half-a-dozen, out of at least twenty specimens which had been killed with poisoned wheat at Flordon, near Norwich. This abominable practice is still, I regret to say, in defiance of legal enactments, pursued by certain farmers in this district, and, as in this case, birds both useful and ornamental are sacrificed in a wholesale manner through the obstinacy and ignorance of individuals. The male birds were in full change, and fast assuming the black head of their summer plumage.

Twite and Mealy Redpole.—The male of a pair of the former species, killed at Beeston, near Cromer, on the 22nd of March, showed the rich flame-colour on the upper tail-coverts; and a mealy redpole, with red head, breast and tail-coverts, was netted near Norwich about the 25th of May, an unusually late appearance.

Cormorant.—A fine adult female, showing the white patch on the thigh, was shot at Burgh, near Yarmouth, on the 27th of March. The ovary contained some eggs as large as small peas. In the stomach was found a sharp-nosed eel, about fifteen inches and a half long, and the remains of two others; also about twenty white worms, measuring from one inch and a half to one inch and three-quarters in length, some of which adhered to the coats of the stomach, whilst others were detached. Mr. J. Gunn also found similar worms, and about the same size, in the stomach of a common guillemot killed on the 16th, and in this case the interior of the bird's throat exhibited several small ulcerated spots about the size of pin's heads. On the 6th of May, whilst inspecting a thriving colony of blackheaded gulls on Hoveton Broad, another fine old cormorant passed over the water near enough to show the white feathers about the head.

Woodcocks Nesting.—On the 17th of May a fine young bird was sent up to Norwich for preservation, being one of four hatched in a plantation at Burlingham, near Norwich, belonging to Mr. H. N. Burroughes. A second nest was also found this year at Attlebridge, and a pair seen, on the 6th of May, at Hoveton, have, I believe, remained there to breed.

Black Stork (Ciconia nigra).—I have much pleasure in recording what I have every reason to believe is the first known instance of this fine species having occurred in Norfolk. This noble bird, which had been seen at different times for nearly a week, by Mr. Hamond's keepers, frequenting some meadows on the banks of the Nar at Westacre, was at last shot about four o'clock in the morning of the 19th of May. Its plumage showed no signs of having been in confinement, and the bird, owing to its shyness, was obtained with much difficulty. It proved, on dissection, to be an adult female, weighing over seven pounds, and measured, I am told, six feet two inches from tip to tip of wings.

Merlin.—A young male, having partially assumed the adult dress, was shot at Beeston, near Cromer, on the 25th of May, but this species is not often met with at this season of the year.

Hoopoe.—I have seen but two specimens killed here this season, one shot at Northrepps on the 21st of May, and one at Rollesby on the 25th.

Puffin.—An adult female, in full plumage, was picked up dead at Beeston about the 19th of May. This bird was in rather poor condition, but showed no signs of having been wounded. This species is but rarely met with on our coast, and then for the most part after violent gales in autumn or winter.

Osprey.—Besides the one recorded by Mr. Gunn (S. S. 823) as killed at Blickling, an adult male was shot at Hempstead, near Holt, on the 13th of June. Though in full plumage this is the smallest specimen I ever saw in this county.

Crossbill.—Several of these erratic visitants have appeared during the spring months. On the 2nd of April a male, in mingled red and yellow plumage, was shot at Mousehold, near Norwich; on the 25th of May two red males and one female at Rollesby, near Yarmouth, and on the 27th and 28th two red males, one male yellow and red, and three females, in the same neighbourhood, no doubt members of the same flock.

HENRY STEVENSON.

Norwich, July 5, 1867.

Summer Migrants, &c., near Norwich.—The following are the earliest dates of the appearance of some of our summer migrants in this neighbourhood, according to my own observations:—

March 22. Willow warblers and chiffchaffs plentiful about the woods and sheltered localities. The garganey or summer teal appears pretty numerously in the vicinity of Yarmouth: a beautiful male was killed at Reepham.

March 27. Wheatear.

April 1. A nest of the song thrush, with young about a week old.

„ 2. An adult male crossbill shot at Mousehold.

„ 3. Spotted crake: several specimens have been obtained.

„ 6. Cuckoo heard.

„ 7. I saw two house martins, about 11 A.M.; they were flying low near my residence.

„ 10. Several sand martins near the river.

„ 11. Wryneck.

„ 13. Yellow wagtail, which appears somewhat plentiful this season compared with previous years. See note on grayheaded wagtail (S. S. 824).

„ 14. Nightingale heard.

„ 16. Redstart (male) seen.

„ 17. Ring ouzel.

„ 19. I saw a blackcap (male), the cuckoo and nightingale.

„ 25. Saw a lad with a nest of nearly fully fledged blackbirds.

„ 26. Dunlins in summer plumage, shot on the coast, also adult males of the lesser blackbacked gull, kittiwake gull and common guillemot.

May. During the course of the first week swifts and redbacked shrikes were seen. I examined the stomach of a specimen of the latter, and found it filled with the remains of a blue tit.

May 13. An immature specimen of the rook, with its entire plumage of a dark ash-colour, was shot at Elmham, near Swaffham.

May 17. Whimbrel (a female) shot on the beach near Beeston Regis.

May 22. Hoopoe (a splendid male) shot in the vicinity of Rollesby: the contents of its stomach were several skins of some lepidopterous larvæ and three or four small brown spiders.

May 22 to 29. Crossbills rather plentiful in the vicinity of Yarmouth: as many as nine specimens, in various stages of plumage, were sent me for preservation between these dates: the contents of their stomachs, in every case, comprised a mixture of fir-seeds and small grit.

May 28. A beautiful adult male of the mealy redpole, in full summer plumage, was shot at Burgh, near Yarmouth. This species is a regular winter visitor to Norfolk, but its occurrence in the summer season is very rare, this being the only instance I have noticed for several years. The lesser redpole, on the contrary, is now quite a resident: I have received the nests and eggs from several different localities—from one in particular where several pairs have bred for six or seven years in succession.

June 3. I dissected three specimens, two males and a female, of the nightjar, and found the stomach of the first to contain one beetle; the second, one beetle and a cockchaffer; and the third, as many as four beetles and some small moths: the whole of the beetles were quite entire; a pair of the finest specimens I have cleaned and placed in my cabinet. This is one of my favourite modes of collecting Coleoptera, and I have obtained a great number of species by the examination of the stomachs of birds that pass through my hands—many perhaps that I should not otherwise have obtained.

June 12. Quail: a male shot near Norwich. I examined the stomach of an adult male cuckoo, and found two distinct circles of hairs attached to the inner membrane, arranged in precisely the same systematic manner as in the former example I recorded in the 'Zoologist.' I gave the stomach, &c., to Mr. H. Stevenson, of this city, who has also examined it.—*T. E. Gunn; 21, Regent Street, St. Giles Road, Norwich.*

Arrival of Immigrants at Looe.—On comparing the arrivals of the summer visitants here with those recorded in the 'Zoologist' for July, I find they arrived here earlier than in most other places, so I am induced to send my notes of seeing them here:—

Wheatear. March 15. One solitary bird: soon became abundant.

Chiffchaff. March 22. Saw three, the snow falling heavily at the time; wind N.E. strong.

Sand Martin. March 23. Two hawking about; watched them more than half an hour, when they made a sudden dash to the eastward, and I did not see any more for a fortnight. Wind N.E., strong.

Tree Pipit. March 24. Within three or four yards of me; the earliest I have ever noted. Wind N.E., cold.

Swallow. April 10. A single bird: saw many within the week. Wind N.E., with heavy rain.

Cuckoo. April 12. This is only hearsay. I was walking with a gentleman in the country, talking of various matters, not ornithological, when he suddenly exclaimed, "There is a cuckoo!"—that is, he heard it. I am unfortunately so deaf that I shall never hear another. I have no reason to doubt that it was heard by him.

Martin. April 28 (almost the first fine day we had in the spring). I saw but one, which flew from a nest of last year; therefore I conclude it must belong to us: not many seen for a week or more.

Swift. May 3. A flight of eight, which I believe remained here: more abundant than usual; I counted yesterday, as well as their rapid movements would allow, seventy-three in one flight. Whether they are collecting together for migrating I do not know. I shall watch them closely. I think it not likely, as they do not usually leave us before the middle of August.

I am pleased to see the extract from the 'Field' newspaper (Zool. S. S. 827), which so fully corroborates my published opinions as to the nesting of the kingfisher.

Cuckoos have been much more abundant than for years past.—*Stephen Clogg; Looe, July* 5, 1867.

Varieties of Birds' Eggs.—The following varieties of eggs were taken in Sutherland in May and June, 1867:—

Merlin. One egg, of the usual size, but containing no yelk, of a dark sepia colour, almost approaching to black.

Redthroated Diver. One egg of a pale green ground colour, with one or two large blotches of reddish brown. Bird shot. Another egg was similarly marked.

Hen Harrier. Five eggs, three of which were much spotted with minute red specks. Mr. Wolley's old correspondent in Sutherland assured me that he had often seen them even more spotted than in this nest.

Blackheaded Gull. One pale blue egg—a common variety.

Dunlin. Four eggs, which were so exactly similar to those of the common sandpiper that had not both my friend Mr. Jesse and myself, as well as the gillie, seen the bird fly off the nest and be joined by the male bird, I should at once have pronounced them eggs of the common sandpiper. Another gentleman took a nest of four eggs precisely similar. My eggs were larger than the type dunlin's eggs, and the large end had the spots and markings very minute, and not circled round it as is usually the case. One egg had a thin shell, and was almost without markings.

Puffin. One egg, much more spotted than I ever saw before: a very handsome variety.—*John A. Harvie Brown; Dunipace House, Falkirk, July* 3, 1867.

Pied Wagtail wintering in North Yorkshire.—This beautiful and useful little bird has always been described as migratory, leaving us (in North Yorkshire) at the latter end of September and returning again at the latter end of February or beginning of March, when bean-sowing commences; and so regular was their return as to give rise to a proverb, "Sow beans when the wagtail returns." In 1862 I was told by Mr. R. Barton, a gentleman farmer living in this village, that there was a flock of wagtails amongst his sheep. I thought he was mistaken, and said so, for it was in December: on going to the field—a turnip-field eaten on with sheep—I found a flock of fifteen wagtails busy amongst the sheep, hunting among their feet and about their heads as they grazed. The shepherd told us that they also picked up the grubs from the turnip-roots which were exposed when the turnips were pulled up. They looked as lively as in the spring months, and my friend, a gentleman of great experience in such matters, assured me it was the first time that he had ever known them stay beyond September. In 1863 and three following years, and all through the severe snowstorm and hard frosts of 1867, they have continued with us. During the late storm of frost and snow they visited the village, and were seen hunting in the streets, fold-yards, back-yards and gardens; but they left for the fields upon the breaking up of the frost, returning to their old haunts at the usual time. I am at a loss to account for this sudden change in their usual habits, for it does not admit of a doubt that they were, before the time mentioned, so far as this place is concerned, migratory, leaving us in September and returning so regularly as to give rise to the country saying already quoted. I called attention to the fact at the time, in the 'Zoologist,' and I see that it has again been referred to (S. S. 634 and 704), and I have during the last three years received several communications from my naturalist friends upon the same subject, so that it is evident this alteration in their habits is not local.—*John Ranson; Linton-on-Ouse, near York.*

The Rock Pipit in Norfolk.—In reply to Dr. Bree's remarks on this species (S. S. 792), I must admit that it is very singular that the rock pipit should breed regularly on the Essex coast and not on our own; but without any, even the slightest, evidence of its doing so, it was impossible for me to include it amongst the residents in my 'Birds of Norfolk.' I have searched for this bird myself repeatedly during the summer months on almost all parts of the coast, at Cromer, Sherringham and Maudsley, at Hunstanton, near Lynn, at Yarmouth, and at Lowestoft, in the adjoining county, yet though well acquainted with the form and colouring of the species, and the difference between its note and that of the meadow pipit's, I have never met with it here. Until the spring of 1864 a Norfolk-killed specimen was a desideratum in my collection, although I had repeatedly offered a good sum for one to our local birdstuffers. During seventeen years I have known of but three specimens killed in this county, one (as I have elsewhere stated) shot at Yarmouth, in February, 1855, during severe weather, and two in the spring of 1864 by the river-side near Norwich, one of which corresponds with the Anthus rupestris of Nilsson. These two I still believe, as stated in my 'Birds of Norfolk,' vol. i. p. 170, "were passing over in their migratory course, and had paused a little while to rest and *feed*," not *breed*, as occurs, through a misprint, in Dr. Bree's quotation. Were the rock pipit otherwise than a rare bird in Norfolk I cannot understand why it should be so comparatively unknown to our resident birdstuffers. I never saw and never heard of any one who had taken a nest of this species in Norfolk, although we abound in zealous egg-collectors, and surely amongst the numbers of meadow pipits to be seen at all seasons, with other common species, in the shops of our bird-preservers, the rock pipits, if common, would occur as well: such, however, is not the case. Even at Yarmouth, where, owing to the tidal waters of Breydon, one would expect to find it rather plentiful, the Messrs. Paget merely remark that "a few are *occasionally* seen about Breydon wall," and I can hear nothing more decided as to its habits, in that locality, to the present time, although probably, if carefully watched for, it would be observed there as a migrant in spring and autumn. In some localities in the South of England, especially in places having a rocky shore, I have found this pipit taking the place, as it were, of the common titlark in the vicinity of the coast: on our shores the titlark reigns supreme, and this, as far as Cromer and its neighbourhood is concerned, I can vouch for, from personal observation, as well in autumn and winter as in summer and the early spring. The difference between the rock pipit and the meadow pipit, when observed feeding together, is very marked, as I had a good opportunity of noticing two years ago, on the summit of the Freshwater cliffs, in the Isle of Wight, where I found a small flock of each species feeding on the bare spots from whence the turf had been dug, and the difference in their notes, as they rose, was also plainly perceptible. Having stated, then, all that I do know respecting this species in Norfolk, I am as far as ever from being able to solve the mystery, why the rock pipit should not breed with us, though known to do so, as Dr. Bree states, on the cliffs about Walton and Felixstow.—*Henry Stevenson; Norwich, July* 5, 1867.

Young Hawfinch at Alton in June.—Last week I had an old male and a young hawfinch brought me: never having heard of their being seen in this neighbourhood except during the winter, I thought the fact of their breeding here should be recorded in the 'Zoologist.' I am having both birds preserved.—*Philip Crowley; Culverton House, Alton, July* 3, 1867.

Scarlet Bullfinch (Carpodacus erythrinus) *in Sussex?*—During a recent visit to Lewes I had the pleasure of examining a most beautiful collection of British birds, the property of Mr. Thomas Monk, of that town. The birds were all stuffed by that excellent taxidermist, Swaysland, of Brighton, and amongst them were many of our rarest visitors: the genus Anthus was represented by six, Motacilla by five and the family Emberizidæ by seven species. Amongst them was a finch which specially attracted my attention: Mr. Monk called it the "unknown finch." The appearance of this bird was something like a very large linnet (*Linaria cannabina*), but with a beak much larger, and in colour reminding me more of the young green linnet; in fact, it looked like a hybrid between the two species. It could scarcely, however, be a hybrid, because several have been taken near Brighton in different years, and it is also very improbable that two such common species would hybridize in a state of nature; the puzzle therefore was, what species could it be? I considered it must be a European bird, and probably, from occurring every autumn, a migratory species, not very rarely met with on the Continent. It might also be expected to be a young bird, for it rarely happens that stragglers are old birds; the latter during their passage follow the course known to them by previous experience, but, on the other hand, young birds when deprived by accident or otherwise of the guidance of their mature parents often stray in their migrations from the direct course. I feel therefore certain, in my own mind, looking at the general structure and size of the specimen, that it is the Fringilla incerta of Risso, which is no other than the scarlet bullfinch (*Carpodacus erythrinus* of Gray and others). Had the bird ever occurred in the adult plumage, I doubt not but that it would long ago have been known as an occasional visitor to this country, but the birdcatchers have always supposed it a hybrid, and attached therefore but little importance to the capture. If my supposition be correct it affords another illustration of the fact that immature specimens present much better evidences of affinity than mature; even the young goldfinch is not very unlike a young linnet.—*J. Jenner Weir; 6, Haddo Villas, Blackheath, S.E., July* 10, 1867.

PS. I placed my communication on the subject of Carpodacus erythrinus in my pocket, with a view to leave it at Devonshire Street, but on my way called at a bird-dealer's: he produced a bird, such as, he said, he "never saw before." What was my surprise when my eyes rested on another specimen of the species or hybrid adverted to! This specimen had been in captivity three months; it differed from the Lewes specimen in having the front of the head and the breast of a bright golden colour, as if the nuptial rosy tint of L. cannabina had been reproduced in the hybrid. The bird was smaller than the green linnet; the tail resembled the latter bird in colour and the beak in shape. I can well imagine such a bird being called Chlorospiza incerta, as it was by Buonaparte: my opinion, however, is somewhat shaken, and I know not whether to consider the birds under consideration hybrids or not. The subject is an interesting one, and should, I think, be investigated.—*J. J. W.*

Magpie with a Yellow Beak.—I may mention with regard to this bird, which seems to have excited a little interest in the 'Zoologist,' that both Mr. Young and myself observed that the yellow colour appeared to be very bright and distinct. Had the bird been simply feasting on eggs I scarcely think that the whole of the black on the bill would have been so regularly and universally concealed. This is of course mere supposition on my part. At the same time I consider that your correspondent Mr. Beckwith (S. S. 826) is right when he considers it an unlikely circumstance that a bird would cross America and appear on our east coast; but is it not likely that it might be an escaped bird, brought over by some sailor to the port of Grangemouth or some other? Sailors are often much given to bringing home curiosities. I do not think that had Mr. Beckwith seen the bird as closely as we did, he would unhesitatingly have pronounced the yellow to be the effect of colouring matter. My friend Mr. Young, however, was much more positive that it was not such than I was. I may further mention that I did not observe the "naked skin around and behind the eyes, which is bright yellow," mentioned by Professor Newton (S. S. 757) as being present in Pica Nuttalli. The Professor again says, however, that in his figure of the bird in the 'Atlas' there is no appearance of this bare yellow skin round the eye. I am afraid that no satisfactory conclusion can now be arrived at with respect to this yellow-billed magpie.—*John A. Harvie Brown.*

Scaup Duck breeding in Britain.—In the 'Zoologist' for July (S. S. 811) your correspondent Mr. Cordeaux asks if there is any well-authenticated instance of the scaup remaining and breeding in Great Britain. I quote the following from Mr. Selby's "List of the Birds inhabiting the County of Sutherland," as observed by him when visiting that county in 1834:—"Scaup Pochard (*Fuligula marila*). A single female was shot by Sir William Jardine in a small loch between Loch Hope and Eriboll: she was attended by a young one, which unfortunately escaped among the reeds. This is the first instance of its breeding in Britain having been ascertained that I am aware of."—*Id.*

Puffins on the Norfolk Coast.—An immature female of the puffin was shot about the 22nd of March on the beach near Beeston Regis. On the 19th instant an adult female was picked up dead on the beach in the same locality. The occurrence of the puffin is rather unusual at this season of the year on the Norfolk coast, and therefore I think it had probably been driven from the northern coast, and fell exhausted and was washed ashore: I could find no indication of any wounds or injury when skinning the bird, although I closely examined it.—*T. E. Gunn.*

Scyllarus arctus on the North Coast of Cornwall.—You can note the occurrence of Scyllarus arctus at Sennen Cove, a white-sand (*i. e.* gulf-stream) bay on the north coast of Cornwall, just east of Land's End. The specimen is a female in berry, but was dead when brought to me.—*Thomas Cornish; Penzance, July* 8, 1867.

Note on the Voracity of the Bornean Crocodile.—Several years since the late Captain Richard Glasspoole presented to the Norwich Museum a fine skull of the above-mentioned crocodile (*Crocodilus biporcatus* of Cuvier), accompanied by the following account, which I believe has never been published, and which therefore appears to me, though not of recent date, to be worthy of record in the pages of the 'Zoologist':—"The formidable animal from which this head was taken measured nearly thirty feet in length, and was caught, in the year 1827, in the river Benja-Massa, in Borneo, where it had long been a terror to the neighbourhood. A few weeks previous to its capture it attacked two men on a raft, father and son: it caught the son by the arm and took him under water, the father jumped into the river to rescue him when the animal left the son and devoured the father: the son reached the shore much injured. It soon afterwards upset a canoe and devoured the chief of a Malay village, whose relations made a vow to revenge themselves, and after long watching succeeded in destroying it: part of the clothing and ornaments of the chief were found in the stomach. This account was given by the Dutch Resident De Groot to Captain Henderson, who presented the head to Captain Richard Glasspoole." This skull has lately been examined by Dr. J. E. Gray, who informs me that it belongs to the species above referred to, which occurs not only in Borneo, but also in some of the estuaries of India, as well as in those of Northern Australia. In confirmation of the great size to which this reptile attains, I may, in conclusion, quote the following remark from Mr. Adams's 'Notes on the Natural History of the Countries visited by H.M.S. Samarang' (p. 365):—The crocodile (*Crocodilus biporcatus*) must occasionally attain to a very large size in Borneo; judging from an enormous skull found whitening on the beach, the owner must have been at least twenty-eight feet long."—*J. H. Gurney; June*, 1867.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

July 1, 1867.—Sir JOHN LUBBOCK, Bart., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Exotic Butterflies,' Part 63, by W. C. Hewitson; presented by the Author. 'The Entomologist's Monthly Magazine' for July; by the Editors.

Election of Member.

Dr. George William Davidson, of 13, Union Place, Edinburgh, was ballotted for, and elected a Member.

Exhibitions, &c.

Mr. Busk (who was present as a visitor) mentioned, on the authority of Dr. Cobbold, that the small worm exhibited at the previous Meeting was not Gordius aquaticus, but Mermis nigrescens.

Mr. M'Lachlan exhibited Ciniflo ferox from Folkestone, where that spider had been captured by Dr. Knaggs; and living specimens of a spider and a large centipede, which were found in the hold of a ship recently arrived from Manilla with a mixed cargo, principally consisting of sugar and hemp.

The Secretary exhibited branches and the fruit of an orange-tree infested with some insect, with regard to which information was requested by Mr. Charles Moore, Curator of the Botanic Garden, Sydney, New South Wales. Prof. Westwood discovered two species of Coccus upon the branches, but was unable to detect anything but mould upon the fruit.

Mr. Stainton exhibited a collection of Micro-Lepidoptera obtained from the larvæ which he had collected whilst at Cannes and Mentone in February and March: the collection comprised upwards of thirty species, amongst which may be specially mentioned a fine series of Depressaria rutana, from larvæ on Ruta angustifolia on the rocks at Monaco; a specimen of Phibalocera quercana, bred from Arbutus; two species of Gelechia, bred from larvæ feeding on Silene Nicæensis, and forming sand-cocoons amongst the roots of that plant (one species being probably identical with our

G. marmorea); a new species of Zelleria, allied to Z. hepariella, for which M. Millière proposes the name of Phillyrella, bred from the flowers of Phillyrea angustifolia; and a Nepticula, bred from the cork-tree. Mr. Stainton remarked that, in addition to the species bred, there were a number of different larvæ which he failed to rear, and among them was another species of Nepticula on the cork-tree with a very peculiar mine.

The Hon. Thomas De Grey exhibited Eupœcilia anthemidana and E. rupicola from Norfolk; and mentioned that he had on the previous day captured in Kent five specimens of Hypercallia Christierninana.

Mr. A. R. Wallace exhibited a collection of Malayan Cetoniidæ, in illustration of the paper mentioned below.

Papers read.

"Observations on Dzierzon's Theory of Reproduction in the Honey-bee," by Mr. John Lowe, of Edinburgh. With a view to test the truth of the theory that "all eggs which come to maturity in the two ovaries of a queen-bee are only of one and the same type, which when they are laid without coming in contact with the male semen, become developed into male bees, but, on the contrary, when they are fertilized by male semen, produce female bees," from which theory, if true, we might, in the words of Von Siebold, "expect beforehand that by the copulation of a unicolorous blackish brown German and a reddish brown Italian bee, the mixture of the two races would only be expressed in the hybrid females or workers, but not in the drones, which, as proceeding from unfecundated eggs, must remain purely German or purely Italian, according as the queen selected for the production of hybrids belonged to the German or Italian race," the writer set to work to obtain hybrids between Apis mellifica and Apis Ligustica, and also between Apis mellifica and Apis fasciata, and the result of his experiments was that Ligurian queen-bees fertilized by English drones and Egyptian queen-bees fertilized by English drones, both produced drones which, as well as the workers, were hybrid in their characters, and bore unmistakeable evidence of the influence of the male parent. From this the Author drew the conclusion that the eggs of a queen-bee which has been fertilized by a drone of another race, whether they develope into drones or workers, are in some way affected by the act of fecundation, and that both sexes of the progeny partake of the paternal and maternal character or race; from which it followed that Dzierzon's was not the true theory of reproduction in the honey-bee. Specimens of the hybrids were exhibited to the Meeting, and Mr. Frederick Smith (who did not consider Apis Ligustica to be specifically distinct from Apis mellifica), after an examination of the specimens, corroborated Mr. Lowe's statement that the hybrid drones distinctly showed characters peculiar to Apis mellifica in combination with the characters which distinguish A. Ligustica and A. fasciata respectively.

"A Catalogue of the Cetoniidæ of the Malayan Archipelago, with Descriptions of the New Species," by Mr. A. R. Wallace. In this Catalogue 181 Malayan Cetoniidæ are enumerated, 70 of them being described as new.

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New Part of 'Transactions.'

A new Part of the 'Transactions' (Third Series, Vol. iii. Part 4), being the third Part published during 1867, and containing a further instalment of Mr. Pascoe's "Longicornia Malayana," was on the table.—*J. W. D.*

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